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# Evaluation of Pharmacy-implemented Medication Reconciliation Directed at Antiretroviral Therapy in Hospitalized HIV/AIDS Patients [letter]

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# Evaluation of Pharmacy-Implemented Medication Reconciliation Directed at Antiretroviral Therapy in Hospitalized HIV/AIDS Patients

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TO THE EDITOR: Antiretroviral therapy (ART) is commonly associated with medication errors in the inpatient setting.a[1,2] Avoidance of errors can be achieved if a complete medication history is obtained upon admission.[3] In National Patient Safety Goal 8, the Joint Commission requires a medication reconciliation be completed for all hospitalized patients.[4] The majority of medication errors in the inpatient setting occur upon admission, transfer, or discharge.[5]

In order to grasp the gravity of this issue, a prospective study was performed between November 2006 and April 2007 at Rush University Medical Center. The objective of the study was to evaluate whether a difference existed between the appropriateness of ART 48 hours after hospital admission between standard practice and a pharmacist driven process. Inclusion criteria consisted of nonpregnant patients aged 18 years or older currently taking ART for the treatment of HIV/AIDS. During the study, 2 phases were completed sequentially, each lasting 3 months.

## Methods

The first phase evaluated the current practice in which medication reconciliation was completed by a nurse. Staff pharmacists reviewed the reconciliation 24–48 hours after patient admission; if changes in current therapy needed to be made, they were communicated to the physician. Forty-eight hours after patient admission, an infectious diseases pharmacist reviewed the medication reconciliation for appropriateness. Regimens were evaluated for appropriateness (in accordance with national guidelines), proper dose, frequency, and administration, as well as for the avoidance of potential drug interactions.

During the second phase, a clinical pharmacist completed a formal one-on-one medication history within 24 hours of patient admission and interventions were then recommended to physicians. A final assessment of the ART regimen was made at 48 hours by an infectious diseases pharmacist. Data collected included patient age, CD4+ cell count, viral load, sex, renal and hepatic function, concurrent medications, current ART (drug, dose, frequency), opportunistic infection prophylaxis, time to complete medication reconciliation, number of interventions suggested, and number of recommendations accepted.

## Results

Twenty-one patients were included in phase 1 and 20 patients were included in phase 2. In phase 1, 11/21 (52.4%) regimens had errors at 48 hours and generated a total of 17 pharmacy recommendations. In phase 2, 1/20 (5.0%) regimens had an error at 48 hours after clinical pharmacist intervention. At the 24-hour pharmacist medication history, 14/20 (70%) regimens had errors and generated a total of 29 pharmacy interventions. Twenty-eight interventions were made, and all were accepted in phase 2. The majority of the regimens in phases 1 and 2 (67% and 75%, respectively) were protease inhibitor (PI)-based versus nucleoside reverse transcriptase inhibitor (NRTI)-based. In phase 1, 57% of each regimen base (PI and NRTI) contained errors; in phase 2, 73% and 60%, respectively, contained errors. Examples of error types are presented in Table 1. Incorrect dosing was found in 23.5% of interventions in phase 1, and in 31.0% of interventions in phase 2. Phase 2 was associated with a statistically significant reduction in medication regimens with errors at 48 hours after admission ($p = 0.001$). Logistic regression demonstrated that pharmacist-driven medication history was associated with an increased likelihood of an appropriate regimen (OR 20.9; 95% CI 2.3 to 185.9; $p = 0.006$). For every 2.1 patients for whom a clinical pharmacist performed a medication history, 1 error was prevented (absolute risk reduction [ARR] = 47.4%). The average time needed to perform a medication history was 19.75 minutes (10–60).

**Table 1.** Description of Medication Errors

| Medication Error | Phase 1 at 48 h, n (%) | Phase 2 at 24 h, n (%) |
|---|---|---|
| Dose incorrect | 4 (23.5) | 9 (31.0) |
| too high[a] | 1 | 8 |
| too low[b] | 3 | 1 |
| Dose frequency incorrect | 3 (17.6) | 3 (10.3) |
| too frequent[c] | 2 | 3 |
| too infrequent[d] | 1 | 0 |
| Drug–drug interaction | 4 (23.5) | 4 (13.8) |
| Drug–food interaction | 1 (5.9) | 1 (3.4) |
| Omitted/duplicate drug | 3 (17.6) | 10 (34.4) |
| omitted | 3 | 8 |
| Inappropriate opportunistic infection prophylaxis | 2 (11.8) | 2 (7.14) |
| omitted | 0 | 2 |
| incorrectly prescribed | 2 | 0 |
| Total | 17 | 29 |

[a]Dose higher than recommended per package insert.
[b]Dose lower than recommended per package insert.
[c]Dose prescribed more often than recommended per package insert.
[d]Dose prescribed less often than recommended per package insert.

A pharmacist-driven medication reconciliation process was associated with a decrease in error rate. These results may be translated to other high-risk populations, demonstrating that a clinical

pharmacist-driven medication reconciliation process can decrease medication errors. Although it is not feasible for all hospitals to implement clinical pharmacist-driven medication reconciliation, it is imperative for hospitals to evaluate their medication reconciliation process. Once areas of opportunity are found, high-risk patient populations can be targeted.

## References


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